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ABSTRACT

A movement therapist reviews ways in which a perceptuo-cognitive approach can help handicapped children in learning and in social adjustment. She identifies specific auditory problems (hearing loss, sound-ground confusion, auditory discrimination, auditory localization, auditory memory, auditory sequencing), visual problems (visual acuity, figure-ground confusion, visual discrimination, visual localization, visual memory, and visual sequencing), and motor problems (physical handicaps, coordination, body image, spatial awareness, kinesthetic memory, and motor sequencing.) She discusses ideas for mainstreamed children with auditory, visual, or motor problems, and then details perceptuo-cognitive motor games designed to remediate the problems. (CL)

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ARTS IN SPECIAL EDUCATION PROJECT OF PENNSYLVANIA

A PERCEPTUO-COGNITIVE-MOTOR APPROACH TO THE SPECIAL CHILD

RENA BETH KORNBLUM

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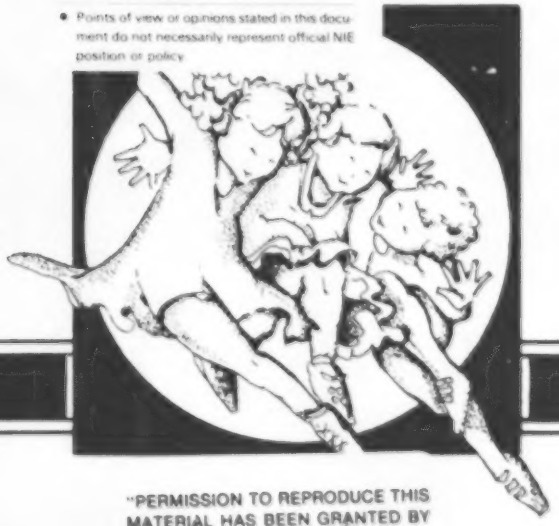

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A PERCEPTUO-COGNITIVE-MOTOR APPROACH TO THE SPECIAL CHILD

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Table of Contents

Introduction 1

Theoretical Background 3

Auditory Problems 4

- Hearing Loss 4
- Sound-Ground Confusion 4
- Auditory Discrimination 4
- Auditory Localization 5
- Auditory Memory 6
- Auditory Sequencing 6
- Ramifications of Auditory Problems 6
- Ideas for Mainstreamed Children with Auditory Problems 7

Visual Problems 9

- Visual Acuity 9
- Figure-Ground Confusion 9
- Visual Discrimination 10
- Visual Localization 10
- Visual Memory 11
- Visual Sequencing 11
- Ideas for Mainstreamed Children with Visual Problems 11

Motor Problems 13

- Physical Handicaps 14
- Coordination 14
- Body Image 15
- Spatial Awareness 16
- Kinesthetic Memory 17

Motor Sequencing 17
Ideas for Mainstreamed Children with Motor Problems 17
General Approaches to the Mainstreamed Child 19
Perceptuo-Cognitive-Motor Games for Remedial and General Growth 21
Auditory Activities 21
Sound-Ground Confusion and Auditory Discrimination 21
Auditory Memory and Sequencing 22
Sound Localization 23
Visual Activities 23
Visual Discrimination and Figure-Ground 23
Spatial Awareness 24
Visual Memory and Sequencing 25
Visual Attention 25
Motor Activities 26
Eye-Hand / Eye-Body Coordination 26
Fine Motor Coordination 26
Gross Motor Coordination 27
Tactile Discrimination 27
Body Image 28
Spatial Awareness 28
Motor Sequencing and Memory Activities 29
Commercial Materials for Perceptual Activities 30
References 31

Introduction

Perceptual problems affect many of our special education children., the learning disabled predominantly, but also the emotionally disturbed, the educable mentally retarded, and sometimes the physically handicapped. As educators it is important to have a basic understanding of what these perceptual problems are and to recognize some of the emotional and behavioral ramifications. This paper will serve as a guide for recognizing some of these problems and look at ways in which the creative arts can help children to explore their feelings and build new skills to better cope with the world. It is important to recognize that this paper is not recommending that teachers serve as therapists. There are times when a child needs to be referred to a therapist and it is hoped this paper will also sensitize educators to these situations.

Most special education children are aware on some level that they are different or defective in some way. Although this may not be a conscious awareness it can result, nonetheless, in one or more of a variety of noticeable characteristics: low self-esteem, lack of impulse control, limited social skills, exaggerated dependence, etc. How often have you heard, "If only he weren't so lazy," or, "If only she'd pay attention," or, "If only he'd sit still," etc.—"then I could reach him/her." Yet, many of these children have perceptual problems that make paying attention very difficult or even impossible in some situations. And these perceptual problems are not always noticeable by casually observing a child. They may be more subtle in nature, such as a short term memory deficit that permits a child to remember only two steps when you are giving directions. This is exemplified when you tell the class to sit down and take out such and such a project and...after the second direction you have lost that child. Recognizing the particular problems your children have can help you to develop creative solutions within the classroom.

Equally important, however, is the recognition of the emotional and behavioral components of a given problem. After finding themselves in these impossible situations enough times, many children begin to see themselves as hopeless, defective, unchangeable. They develop emotional and behavioral patterns in an attempt to compensate for or to avoid their difficulties. These patterns become part of the way they organize their world and define themselves. As a result they cannot always see how they present themselves.

We all develop compensating or avoiding behaviors to deal with

stressful situations. Some of us may feel clumsy and therefore avoid physical activities. Others think they cannot carry a tune or are not musical and avoid singing. Still others feel they are not attractive and may avoid certain social situations. These inner definitions of ourselves can sometimes serve to limit our growth.

The children we see may do this to the extreme. There is the child who decides not to talk in class, to become invisible, so that neither teacher nor peers will be able to detect any shortcomings; the child who starts a fight anytime a situation arises where self-esteem may be at stake, or the one who clowns around all the time. Some children cannot sit still when their anxiety rises and lose all sense of where they end and others begin. It is important to remember that while we as adults can, for the most part, avoid the situations that do not fit in with our inner definitions, these children cannot escape the expectations in their classroom.

Handicapped children need a place to explore their feelings about themselves, to develop new skills to deal with their perceptual deficits and to increase their self-esteem. The creative arts can provide this in a fun, non-threatening way. There are structured activities that can help to increase concentration, impulse control, frustration tolerance and more. There are also activities to improve the deficient auditory, visual and motor skills. These will be elaborated upon later in this monograph.

Improvisation and role playing provide a means to explore feelings. Behavior patterns of which we are not usually conscious can be expressed in the various art media without the interference of the complexities of concrete events and objects. These opportunities for self-expression through the arts enable children to become more aware of the defeating behavioral and emotional patterns they present and to experiment with new ones. Since there is no right or wrong in improvisation they are successful; their self-esteem increases and they have a positive shared social experience.

Sometimes children learn to cope with their problems in ways that limit them. These are the children who need to learn new skills. It is important to remember, however, that other times children learn to compensate in ways that *increase* their functioning ability and these need to be recognized and encouraged. In either case, the creative arts provide safe surroundings in which children can express themselves in tangible ways that aid communication with others and increase the options available to them for meeting their needs and meeting the requirements of the world.

Theoretical Background

For the past six years, I have been working as a movement therapist with handicapped children of all ages. During this period I have worked closely with Dr. Martin Kane, an optometrist and specialist in learning problems. The material presented in this paper is a synthesis of my own experiences, unpublished papers and personal communication with Dr. Kane, and the writings of several learning theorists, noteworthy among them: *Children With Learning Disabilities* by Janet Lerner; *Perceptual-Motor Learning—Theory and Practice* by Lerch, Becker, Ward, and Nelson; and *Thinking Goes to School* by Furth and Wachs.

Perceptuo-cognitive theory states that the way in which individuals move, the way they perceive their environment and their ability to learn are all somehow interrelated and interdependent. (Lerch, Becker, Ward & Nelson, 1974) There are three steps seen in the process of learning; namely, *input, organization and output. Input* is the transmission of sensory information to the brain, also called the receptive function or decoding. Once the information arrives in the brain it is *organized* in light of previous information. This second step is called the *associative function* and requires the *integration* and *synthesizing* of knowledge. Both of these functions are invisible, taking place within the individual. What we see is the third step, the *output* or *expressive function*, sometimes called encoding. (Kane, 1982) Children who are not learning as effectively as possible may have difficulties in one or more of the functions enumerated above, and are therefore said to have perceptuo-cognitive problems.

Before we can plan programs to aid in the growth of these handicapped children, it is important to have a clear concept of the various specific perceptuo-cognitive problems and how each may affect the student's classroom functioning. These problems will be divided into three categories: auditory, visual and motor. The most common problems in each area will be discussed. Although the problems are presented as separate entities, they often overlap.

Auditory Problems

I will discuss and define the following six auditory problems: hearing or frequency loss, sound-ground confusion, discrimination, localization, memory, and sequencing.

HEARING LOSS:

A hearing loss is an input or reception problem. It can be a mild problem resulting in a small loss at only one end of the frequency spectrum or a severe loss requiring hearing aids and special needs in terms of language. The child with a mild loss may have some problems hearing certain sounds when spoken by a female voice but not by a male or vise versa, depending on which end of the frequency range the loss occurs. In addition, this loss may not be constant. A child with severe allergies or frequent colds, for example, may experience a hearing loss only when the allergy or cold is active. (Northern, 1978, pp.241-2)

SOUND-GROUND CONFUSION:

Sound ground confusion can be defined as the inability to concentrate on a specific sound as separate from the complexity of background sounds in the environment. Sometimes this is the result of an input problem related to a hearing loss and sometimes it is an organization problem related to the ability to focus and attend. (Kane, 1982) The child with this problem cannot distinguish the important sounds (e.g., your voice giving directions), from background noise (e.g., papers rustling, a clock ticking, someone walking by in the hallway). Put a child like this in a gym class where the level of background noise is unusually high and he/she will be everlastingly distractible. While you are telling the class to line up, this child may instead be hearing conversation on the other side of the room, a condition comparable to the operation of a condensor microphone in a cassette recorder, which picks up all the voices in the room equally.

AUDITORY DISCRIMINATION:

Auditory discrimination is the ability to distinguish one sound from another, to identify words that are the same and ones that are different. It is also the ability to blend single sounds together in a

whole (m-a-n to man) and to separate the whole into its parts. (Kane, 1982) A problem in this area can be fairly minor, e.g. confusing only "b" and "p" sounds, or it can be more involved, resulting in severe comprehension problems. Furthermore, it can effect only the perception of word beginnings, middles, or endings—or involve all three. Children with severe auditory discrimination problems cannot function in a normal class setting. They need special help in the form of intensive speech therapy. Children with mild to moderate problems may be able to function in a normal classroom but need to make a constant extra effort to understand. Without consistent support, the effort can at times be too difficult to maintain, the alternative of "spacing out" being far easier.

As with sound-ground confusion, a problem in auditory discrimination can also be either an input or an organizing problem. It can be the result of a hearing loss or a neurological problem, both related to input, or it may be linked to the cultural "set" in which a child is raised. For example, children who are brought up with one language and for some reason are emerged in another language, may not hear the "new" sounds of the second language. This is due to the fact that they do not expect to hear these sounds and therefore do not listen for them. The child with a moderate to severe discrimination problem, however, usually has an input problem, generally recognizable through a problem in the expressive function, such as a speech defect.

AUDITORY LOCALIZATION:

Localization is the ability to distinguish the general area from which a sound is coming. When a teacher directs the class to "look" or "come over here" the child with this problem is unable to tell where the sound originates. Localization is a difficult problem to recognize because many children learn to compensate visually. (Kane, 1982)

Thus far, the four areas examined, namely, hearing acuity, sound-ground confusion, discrimination and localization, all take place when the stimulus is present. They are ongoing activities. The last two areas, memory and sequencing, pertain to information that has already been received. *Memory* is the ability to store and retrieve information when the stimuli are no longer present; *sequencing* is the ability to organize and recall this information in a specified order. Without both memory and sequencing, learning cannot take place since each experience would be perceived as being unique, with no connection to previous experiences. (Lerner, 1971)

AUDITORY MEMORY:

Auditory memory is the ability to store and recall what one has heard. A memory deficit is an associative disorder and may occur in two different ways. It may be an immediate or *short term memory* problem, which is the inability to remember more than a few things presented at one time—a one or two step command in severe cases; three and four step commands in more subtle ones. For the child with a severe problem, the usual instructions given in class are impossible to follow. At a continual loss as to what is expected, he/she may either withdraw or seem "all over the place" whenever instructions are spoken.

The child with a less severe problem may often be the one who is thought of as not paying attention, who at times seems to be doing well and at other times seems unwilling or unable to do as he/she is told. This inconsistency can often be related to how much memory is required for a specific task. It may even have to do with the fact that memory is connected to emotional stress and physical well being and can fluctuate from day to day. (Kane, 1982) Interestingly, a child who cannot remember spoken instructions may be able to remember complex songs. Singing utilizes a different brain function than speech, and also involves rhythmic cues which aid in making associations. (Kane, 1982)

A memory deficit can also be *long term*. A child may remember what is presented today or even tomorrow but unless there is constant review, he/she cannot remember what was said last week or last month. "Long term memory requires the ability to assimilate, store and retrieve information when it is needed. It is dependent upon the learner's skill in seeing the relevancy of the material and relating it to past knowledge." (Lerner, 1971)

AUDITORY SEQUENCING:

Auditory sequencing is the ability to remember sounds, words, or rhythms in the order they are presented. (Kane, 1978) A child with a sequencing problem may have an excellent memory but confuses the order. This child can never quite get a story straight. Past, present and future are not clearly differentiated. This is an organizational problem. On an expressive level, the child may mix up the order of words and in the case of a severe problem, may even have difficulty saying more than single syllable words.

RAMIFICATIONS OF AUDITORY PROBLEMS:

A hearing problem is a physiological process that does not

involve interpretation. Listening pertains to the ability to evaluate what you hear. It requires you to select appropriate meanings and organize ideas according to relationships. The ability to listen and to interpret what has been said forms the foundation of language skills. A child with a defect in listening skills has a communication deficit as well. (Lerner, 1971, p.160)

Because cognitive functioning is so dependent on speech and language, a child with a severe problem in auditory functioning is less likely to be able to cope in a normal classroom setting than a child with visual or motor problems. Auditory problems can often appear to be behavioral problems because of the attending difficulties that result from them. It is important, therefore, to determine what specific type of problems are affecting your students. If you suspect an auditory problem, your first course of action should be to request an audiological exam. If this test indicates no hearing loss, your student may have a listening problem. The audiologist should be able to recommend where to go next.

IDEAS FOR MAINSTREAMED CHILDREN WITH AUDITORY PROBLEMS:

If you have only one or two handicapped children mainstreamed into a class of thirty or more you will not be able to do remedial work. There are, however, several things you can do to help these children cope better with their problems. The following suggestions may prove useful.

The child with a hearing loss or a discrimination or a localization problem may find it easier to cope if sitting or standing near the instructor. Put the child where he/she can read your lips. If you write instructions on the board, turn around and repeat them facing the class. Make sure that you have the visual attention of the child. Try not to talk while standing near a door or a window because that creates more reverberation. If you have the resources at your disposal you could try carpeting. Even little carpet squares spread around can help diminish background noises. Using rubber tips on chairs or other movable equipment can also help. If you have a teaching aide, try separating the class into two smaller groups with a room divider. You might seat a child who has sound-ground problems against a non-reverberating wall so that one ear has less input.

Children having sequencing problems will benefit from words such as "*First* do such and such and *then* do such and such" as cues for ordering directions in a time sequence. It may be necessary to write instructions on paper for the special child when pre-

senting verbal instructions to the others. This will help sequencing and memory problems. You can also use visual cues in movement as well as in writing. Demonstrate what you are asking the class to do. The possibilities are many—limited only by your degree of understanding about these problems and the resources you have at your disposal. (Lerner, 1971; Kane, 1982; Dryburgh, 1982)

Visual Problems

Just as listening differs from hearing, vision differs from seeing. An eye can be healthy physiologically but a child may still have a visual problem. Vision is concerned with the skillful and efficient use of both eyes to get meaning, and to understand what is being seen. I will discuss six visual problems which correspond to the six auditory problems discussed in the previous section, namely, visual acuity, figure-ground confusion, visual discrimination, visual localization or spatial organization, visual memory and visual sequencing.

VISUAL ACUITY:

Visual acuity is defined as the keenness of vision with accommodation relaxed. (Borish, 1975) This relates to how clearly one can see close up and far away without compensating or straining the eyes. A person who is nearsighted will have blurry vision far away which cannot be compensated for without corrective lenses. A person who is farsighted may be able to see clearly at all distances but only at the expense of straining the eyes. Due to this, farsighted children are sometimes missed at visual screenings at school. There is a test however, that an eye doctor can use to tell if someone is accommodating. The untreated farsighted child will get headaches and tired eyes from reading. He or she may also not be able to maintain clear vision when switching from looking far away to close up. A child with that problem would not be able to copy things from the board to paper. Children who rub their eyes whenever reading or complain of headaches, or make frequent postural changes when looking close up need to be referred for a thorough eye examination. Acuity problems can often be helped by corrective lenses, but there are also visually handicapped children with uncorrectable problems who are mainstreamed and need special help.

FIGURE-GROUND CONFUSION:

Figure-ground confusion is the inability to "visually pick out and see a simple figure or object in a complex background." (Lerch et al., 1974, p.43) A child with this problem might not be able to pick out a fly ball against the bleachers. This child may have difficulty reading music (distinguishing the notes from the staff) or picking out

the central theme in a drawing. The child with figure-ground confusion will have difficulty with physical demonstrations.

VISUAL DISCRIMINATION:

Visual discrimination is the ability to distinguish similarities from differences and parts from the whole. A baby first learning to see perceives parts, e.g., the four sides of a square, separately, and only later will be able to make it out as one object—a square. Eventually, the child sees the whole object at a glance and must remember that it is made up of parts. (Lerch et al., 1974, p.16) The younger school-age child tends to see things more holistically, while the older child sees the parts more readily. To function maximally it is important to be able to move back and forth between both perspectives. The ability to visually see the parts and make a whole and see the whole and know the parts is an integral part of learning to read and write. We have to both see that C-A-T spells cat and know that the word cat is made up of the letters C-A-T. (Kane, 1982) The child with severe discrimination problems will not be able to learn to read. Visual discrimination problems coupled with sequencing problems can cause dyslexia, the inability to follow words and letters in the proper order, as well as difficulty with specific letters such as "b" and "d."

Consider the effects of this problem. Imagine the self image of a child with normal intelligence who cannot learn to read even when motivated, or reads something different from what is on the paper (as in dyslexia). These children often think of themselves as retarded and as failures. After trying and failing for so many years their frustration tolerance may be extremely low. They may also have a lot of pent-up anger.

VISUAL LOCALIZATION:

Localization or directionality is the ability to visually organize material in space—left/right, up/down, and front/back. (Lerch et al., 1974, p.26) In this usage, space relates to where things are on one's paper as well as where things are in the environment. A child with moderate visual localization problems will have difficulty copying from the blackboard (vertical) to a piece of paper (horizontal). He/she will also have difficulty organizing material to fit on the page and may not know where to go in gym class. This child may seem to be "all over the place" because he/she lacks the visual organization to get from one place to another on the page or in space. Reading may also prove to be difficult because of the need

to move systematically from left to right.

VISUAL MEMORY:

Visual memory is the ability to retain and later recall a number of things presented on a visual level. (Lerner, 1971) A child with a problem in this area may have great difficulty in copying something; he/she may not be able to remember more than a letter at a time. If shown an example and asked to draw a picture around that theme, this child might not be able to remember the original idea. In gym class where activities are often demonstrated, this child will not be able to follow. On a more extreme level this child might not be able to remember what letters and numbers look like and may not be able to learn to read. As in auditory memory, this problem is not an input issue but an organizational one.

VISUAL SEQUENCING:

Visual sequencing is the ability to visually organize material in time, from beginning to end. This is also an organizing function and directly affects the ability to learn. In order to read, one must know to begin at the top of the page and work down from there. Visual sequencing is closely related to localization or spatial organization; sequencing deals with the "when" and localization with the "where." Both have an effect on classroom performance. (Kane, 1982) The child with a sequencing problem may not be able to follow the steps in a demonstrated task and as a result will perform in a very disorganized way.

IDEAS FOR MAINSTREAMED CHILDREN WITH VISUAL PROBLEMS:

Although remedial work is difficult to accomplish in a class with only one or two handicapped children, there are a number of things that can be done to help these children function better. The child with uncorrectable acuity problems (visually handicapped) may find it easier to cope if seated near the chalkboard or near the person demonstrating something. For children who are legally blind—partially sighted or totally blind—resources are available to have written material converted into large print or braille. Another creative solution might be to pair such a student with a normally sighted child who would be willing to assist and demonstrate.

For all children who have difficulty functioning visually, getting them to verbalize what is happening will add the auditory sphere

and possibly give them another resource. With figure-ground confusion, verbally naming the object that is important to see may help bring it into focus. When demonstrating, avoid standing against a distracting background. If a child cannot organize material spatially to copy it from the board, make sure the master sheet is available to copy from at his/her desk. With visual sequencing, as in auditory sequencing, use the words "*first* this and *then* that." Present the activity and then break it down into steps, having the class follow each step. When presenting written material, also read it, if possible. For a *memory* problem have the child try to *associate* the objects or theme with something he/she already knows. The child with poor visual memory, visual discrimination, or visual localization may benefit from auditory and/or tactile cues.

Motor Problems

Children first experience the world through their bodies. It is through the touch of others and the gradual control of their own body parts that they begin to learn who they are and that they are separate entities from their mothers and the rest of the world. Many learning theorists—Piaget, Getman, Kephart, Barsch, Hebb, etc.—believe that higher learning is based on early motor experiences. Children are continually handling objects and moving their bodies in relation to those objects in order to understand their world on a motor level. This understanding forms the basis for using the other sensory information coming in; visual, auditory, olfactory and gustatory. As this sensory information forms patterns, children learn what effects they can have on the environment. Through a great deal of exploration, this information gets organized and they are able to form concepts of the concrete world and eventually to think abstractly as well. Thus, early movement experiences are essential to our full development. It is important to note, however, that movement in itself is not enough to make this early learning occur. If that were the case the hyperactive child would be a genius. Movement must instead be organized and directed in some way for learning to take place. (Lerch et al., 1974 & Lerner, 1971)

Proprioception, kinesthesia and tactile perception are the three systems that affect our movement and body awareness. *Proprioception* refers to information about the changing states of muscles, tendons, and joints. This information is usually received at a subconscious level but is vital to the proper performance of coordinated and voluntary muscular activity. (Ayres, 1973 & Basmajian, 1976) Balance is a function of proprioception; it is through this sense that we know when we are upright.

Kinesthetic perception is "the conscious awareness of joint position and movement." (Ayres, 1973, p.67) It provides us with information concerning the positions of different body parts. Bodily feelings of muscular tension and relaxation are examples of kinesthesia. *Tactile perception* is the information received through fingers and skin surfaces via the sense of touch. (Lerner, 1971 & Ayres, 1973) The abilities to discriminate between one object and another and to recognize which body part is being touched are examples of tactile perception.

It is through the above three systems that we are able to direct and organize our movements in order for learning to occur. Specific motor problems that will be discussed are as follows: physical

handicaps, coordination, body image, spatial awareness, kinesthetic memory and motor sequencing.

PHYSICAL HANDICAPS:

A physical handicap may or may not have an anatomical anomaly. Children with cerebal palsy *look* handicapped. These children receive physical therapy to help them develop better skills and to learn to compensate for their weaknesses. The world acknowledges their problem. These children not only have to learn to cope physically with their problems but emotionally as well. All of us, especially in adolescence, find things about ourselves that we do not like. We are too short or too tall; we develop too slowly or too fast. We go through intense self-judgement and this affects the way we see ourselves for the rest of our lives. Children with *physical anomalies* have to learn to accept their looks and movements if they are going to develop healthy body images. This *emotional aspect* is often overlooked.

Some children who have physical handicaps do not look abnormal. Their handicap is within the neuro-physiologic system but it has no outward anomaly. The hyperactive child is a good example of this. In hyperactivity there is a central processing dysfunction. (Adamson & Adamson, 1979) These children are sometimes seen as behavior problems but they cannot control their behavior alone. Sometimes, they receive therapy for the emotional aspects of their problem but not the neurological aspects. An even more subtle example of this is a child with a tactile dysfunction. Touch that one would expect to be comforting may be extremely agitating and unpleasant to a child with this problem. This child may be seen as unsociable because of withdrawing from touch. What may be comfortable instead is hard pressure against the body which may lead to situations of fighting, squeezing, pushing—the touch we see as aggressive. (Ayres, 1973, p.66) Such children cannot describe their problem—they do not know they have a specific problem. Instead of sympathy for a physical handicap, they are more likely to meet with irritation and anger. It is important to realize that while some unacceptable behavior is an emotional expression of frustration, anger, poor self-esteem, etc., some behavior is not. This behavior is not volitional and needs special sensory integrative work.

COORDINATION:

Coordination is harmonious, integrated action or interaction.

There are three types of coordination that occur most frequently in literature dealing with perceptual-motor problems: eye-hand or eye-body coordination, fine motor coordination, and gross motor coordination. *Eye-hand* or eye-body *coordination* deals with the interaction between the visual and motor systems. Copying a circle, for example, requires seeing the circle accurately, converting the visual information into the kinesthetic or motor modality, and drawing it. This type of coordination requires intact visual and motor systems and the ability to convert information from one system to another. Eye-hand coordination is necessary for fine motor tasks such as threading a needle and copying written material, and for gross motor tasks such as hitting a baseball and aiming and accurately throwing a basketball.

Fine motor coordination relates to the movements of the fingers, tongue and eyes. (Kane, 1982) It is usually associated with more delicate or subtle movement as in sewing, writing, licking etc. Fine motor coordination is required to play most musical instruments. Watching requires fine motor coordination in the eyes.

Gross motor coordination involves the large muscles of the body and relates to the ability to move various body parts or to perform whole body actions on command. The development of gross motor coordination involves controlling movement in relationship to gravity, body midline and laterality. (Lerner, 1971) Coordination is sometimes thought of as learning to perform specialized activities in a skilled way. However, there are general coordination tasks such as balancing, walking, running, skipping, jumping, etc. that aid in the general motor functioning and spatial orientation of a child.

A child with major coordination problems will be noticeable in class. This child will appear clumsy and will be unable to perform many tasks that we take for granted. A child with a milder problem may have difficulty only around specific tasks—evident only when those tasks are required.

BODY IMAGE:

Body image is the *internalized picture* of oneself that one carries around. (Salkin, 1973) Through our body image, we know where our body ends and another begins. We know where our body parts are in relationship to each other and the function of these parts. One of our tasks as an infant is to learn that we are separate from our mothers. Our tactile sense is stimulated by the touch of others (through rubbing and stroking, bathing and dressing) and by our own explorations of our hands, feet, face, etc. If our tactile system is functional and we get the proper amount of environmental stimula-

tion, we come to know our *body boundaries*. We gradually get a sense of our own qualities—tall, short, thin, fat, etc. We learn how much movement of each body part is necessary to have a specific effect on the environment. We are able to discriminate one body part from another, and know how all of our parts work together to present a picture of ourselves.

Sometimes, because of organic or environmental causes, we do not develop an accurate body image. We may think we are being friendly when we really look tense and angry. We may constantly over-estimate how much movement is necessary for a task. A child with a body image distortion may always be clinging to the teacher or another child, invading their personal space. Unaware of how far away to stand from others, unclear about his/her body boundaries, such a child tends to melt into other people.

In relation to a body image problem, a child may have a *tactile/kinesthetic dysfunction*, i.e., difficulty discriminating between textures or shapes through touch. It is interesting to note that while some children cannot discriminate through touch, others seem to be able to learn only through a hands-on technique. Although this approach is normally needed in early years, older children with poor visual and auditory skills may need to be touching something to understand it and its relationship to them.

SPATIAL AWARENESS:

Spatial awareness is the ability to know where one is in relationship to the environment. Spatial awareness deals with the perception of self, the relation of self to objects and the relation of objects to objects. (Barsch, 1967) In order to define space a child must first have an internal reference system for delineating movement—an internalized sense of the three planes, up/down, front/back, left/right. Spatial movement can occur in the space around the body, such as reaching, breathing, and turning in place, or it can occur by moving through space, using locomotion to get from one spot to another. (Salkin, 1973) While spatial awareness is often dependent on or coordinated with vision, a child can have an intact visual system and still seem lost in space. A child with poor spatial awareness may not know left from right and may have difficulty with tasks that require crossing the body midline (reaching from left to right or vice versa across the body). Such a child may understand the directions given and may even see where to go but still be unable to organize his/her body to get there.

KINESTHETIC MEMORY:

Kinesthetic memory is the ability to remember the positioning and movements of various body parts and the body as a whole as it moves through space. For example, after the first couple of times you do a forward roll, you can close your eyes and remember what your body felt like throughout the trick. Or, you remember what it felt like when your baseball coach positioned your body correctly to swing at a baseball with a bat. Without this kinesthetic memory it is difficult to master motor tasks. You cannot form concepts of what to do in certain situations without the ability to store past experiences and recall them when needed.

MOTOR SEQUENCING:

Phrasing is the ability to organize movement in time with clear beginnings, middles, and endings. To perform motor activities specific body movements must follow others. Difficulty sequencing on a fine motor level can manifest itself in difficulty writing from left to right. On a gross motor level, the child with poor motor sequencing is often a child who appears to have hyperactive tendencies or poor impulse control. This child will seem disorganized and will have trouble following directions. He/she may start with a sense of purpose and then seem to lose concentration and a sense of direction. The timing of this child is off and may seem out of synchrony with the environment.

IDEAS FOR MAINSTREAMED CHILDREN WITH MOTOR PROBLEMS:

If you have children in your class who have difficulty staying put and organizing themselves in space, you can help by providing visual and auditory cues. Taped markings on the floor, an "x" for each child or lines for rows of children, coupled with the verbal cues of "staying on their mark," help provide visual boundaries for a child who lacks body boundaries. Having the class repeat instructions that require spatial movement helps develop the sequencing pattern. Telling an individual child to sub-vocalize (whisper to oneself) the directions while doing the actions may help to keep that child focused. Children with body boundary and phrasing difficulties are often serious behavior problems. Use vocal phrasing such as, "When I count to three everyone put both hands on the floor and freeze." Touching the floor gives a tactile boundary to a child that lacks an inner one. Touching the wall while waiting for a turn does

the same thing. Likewise, if you touch the wall while preparing to start an activity it gives a good signal for the beginning. Find a similar way to signify the end (either by touching a solid object or freezing in a specific position) and you have provided concrete boundaries on a movement phrase. It is also possible to help children find boundaries at a desk. For example, hands have to be flat on the desk to mark the beginning, and put somewhere else to signify the end.

When teaching a new task, have the children close their eyes for a moment and feel (internally; without moving) how their body is positioned. Ask the children to associate the task they are learning to something they have done in the past. Such associations help all memory problems.

General Approaches to the Mainstreamed Child

Thus far I have been approaching perceptual problems from a somewhat idealized standpoint, where, with the help of professional testing resources and recognizable symptoms, a tailored approach can be developed to fit a specific child. This remains the most effective approach. Often, however, a number of children exhibiting a variety of perceptual handicaps have to be handled collectively within the context of an entire class. The following are some more generalized approaches to teaching mainstreamed children.

1. Whenever possible, present information in a *multi-sensory* approach, e.g. write it down and speak while facing the class, or both say and do it. Make directions as clear as possible with as many cues as possible.

2. Most children with moderate to severe problems in one or more areas have an emotional overlay. If you have children who get anxious and disruptive during certain lessons try to provide *concrete boundaries* for them as described in the movement section. Even if they do not have motor problems, clear boundaries help *reduce anxiety* and *aid in concentration.*

3. Try to find your students' *strengths* and use them.

4. Use a *buddy system* to enable peers to help each other.

5. Present yourself in the *least distractible way*. Consider the effect of the colors or patterns of your clothing. Try to present yourself against a plain background. Try to reduce background noise, and use room dividers or desk cubbies to eliminate distraction.

6. Use *firmness and understanding* when setting behavioral limits. Remember that these children are being forced to face their deficits and failures every day.

7. *Observe* which activities provide the most difficulties as well as those which really "work." These can give you clues as to what approach might help the most.

8. Use words and symbols to represent *first* and *after*. This helps sequencing problems and aids in organization for all handicapped children.

9. Use *association* for all *memory* problems.

10. Have children *repeat instructions out loud* or *sub-vocalize* what they are doing. Verbalization helps the teacher know what has been heard and helps children to concentrate.

11. Keep calling attention to the central theme and ask for eyes to be on you.

Perceptuo-Cognitive-Motor Games for Remedial and General Growth

Perceptuo-cognitive-motor games build skills not only for children with deficits but also for normal children whose growth can be enhanced. Perceptual growth is part of normal development. The activities can be fun and esteem building. Every child will have areas in which to shine and areas that need growth. Children with deficits can be helped to expand their abilities while children without these deficiencies may learn to channel their experiences in new and exciting ways.

All of the following activities can be done in a general classroom. Among them are some that are specifically suited to gym, music and art classes as well. For those activities that would be well suited to a specialty class I have used the following code; **M** = music, **G** = gym and **A** = art. These activities are meant to be fun. They should be used with a non-fail approach that will build self-esteem at the same time as building skills. As we help children to grow perceptually we also want them to grow emotionally and intellectually. *The challenge of education is to make whole people who have developed the widest range of options possible for them.*

Many children can build on a weak area by first utilizing an area of strength. As I present the first few auditory activities, I allow the children to use their visual and motor systems in combination with the auditory task; later, they use auditory cues alone. The same can be done with the other activities but I have left it up to the user to make these adaptations. Some children, however, are confused by additional cues. For them, you can adapt to a more simplified approach.

AUDITORY ACTIVITIES:

Sound-Ground Confusion and Auditory Discrimination

1. MUSICAL INSTRUMENTS:

   a. Have the child play each instrument, listen to it and verbally describe the sound one makes compared to the others (auditory w/motor).

   b. Play each instrument while the child is looking and have the child say what it is (auditory w/visual).

   c. Have the child close his/her eyes while being handed an instrument. After playing it, the child must say what it is

(auditory w/motor).

d. With eyes closed the child must guess what instrument you are playing (auditory alone). **M**

Instead of playing instruments you can use the sounds made by common objects in the room such as dropping a pencil or crumpling a piece of paper. Do these games with as little background noise as possible. Then, slowly add some background noise, such as talking while the instruments are being played.

2. ENVIRONMENTAL SOUNDS: Point out some environmental objects that make noise—cars, clocks, footsteps.

a. Have the children visually locate these objects and pick out their specific sound above the general noise (auditory w/visual).

b. With their eyes closed, have the children try to pick out these sounds. (Lerner, 1971, p.135)

3. HEAR AND MATCH: Obtain several small opaque jars the same size (film canisters work well). Fill two with rice, two with beans—sand, water, etc. (Educational supply stores sell sets of these cans already made.) With their eyes closed, have the children match the cans with identical sounds. (Lerner, 1971, p.135)

4. SELECTIVE LISTENING: Using records or tapes, have the children listen for a particular instrument, rhythm, or vocal part. Start with simple music and gradually get more complex. **M**

5. RHYMING WORDS: Make up songs with the children which require rhyming words. Rhyming works on discrimination. Set your song to music with instruments keeping a specified background rhythm to introduce sound-ground discrimination. **M**

Auditory Memory and Sequencing

1. CODING: Play a sound pattern by clapping, bouncing a ball or playing an instrument. The children must play back this pattern. Start with only two beats and slowly add more. Then introduce loud and soft sounds, as well. (Lerner, 1971, p.136 & Kane, 1978) **M, G**

2. SEQUENCE STORIES: Tell a story and have the child:

a. tell it back in proper order,

b. draw a series of pictures to illustrate it,

c. act out specific incidents in their proper sequence, and

d. tell a story about something that happened to him/her. **A, M, G**

3. "MOTHER MAY I?": Tell the child to do a series of activities such as "take two small steps, turn around and take a giant step." The child must repeat the instructions and ask "Mother May I?" If the directions are correctly repeated, they are allowed to move. The goal is to be the first person to reach a specific point in the room. Again start with two steps and slowly build. **G**

4. ADD A SOUND: The first child in a group makes a sound. The next child repeats the first sound and adds another, etc. Cumulative songs such as "There was an Old Woman Who Swallowed a Fly" can also be used. Have the child say the sequence after singing it since singing and speech are two separate brain functions. **M**

Sound Localization

1. FIND THE SOUND: Hide a music box or ticking clock and have the children try to locate it. (Lerner, 1971, p.136) **G**

2. SOUND DIRECTION: Blindfold a child and make a sound somewhere in the room. The child must judge if the sound is near or far, right or left, high or low, in front or in back.

VISUAL ACTIVITIES:

Visual Discrimination and Figure-Ground

1. PARQUETRY BLOCK GAMES: These games emphasize part-whole discrimination and spatial awareness.

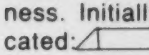
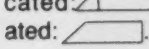
a. Select a block and the child must select one that matches it.

b. Construct a design and the child must make a matching one. Diamond shapes are more difficult to use correctly than squares or triangles because of their diagonal structure. Shapes that are rotated such as a tilted square are also particularly difficult.

c. Construct a design that has some separations between

the pieces. The child must match this.

d. Make two identical designs. While the child's vision is blocked, remove or add blocks to one of the designs. The child must ascertain the changes and fix the unaltered design so they are again identical.

e. Use illustrations of designs and have the child use the blocks to match the picture. The picture may be rotated or placed in different spots in the room to develop spatial awareness. Initially, the blocks in the pictures are demarcated:  . Eventually the demarcation is eliminated:  . (Furth & Wachs, 1974, pp.142-145)

2. PEGBOARD GAMES: These games emphasize figure-ground discrimination and spatial awareness. Pegboards can be bought commercially. Five inch square wooden ones with ten rows of ten holes each are preferable. Use two pegboards, one for yourself and one for the child. The object is to have the child copy your design. The simplest form to copy is a straight line across a row or down a column, all from pegs of one color. Color is varied next, then more rows are added to the design. (Furth & Wachs, 1974, p.150-51)

3. INDIAN BEADS: Make jewelry from indian beads and have the children duplicate your designs.

4. PUZZLES: Puzzles emphasize part-whole discrimination. Have the child draw a picture, paste it on cardboard and cut it up into pieces. You now have a puzzle to put together. Putting together commercial puzzles is also good. (Lerner, 1971, p.133) **A**

5. BALL PLAYING: Ball playing emphasizes figure-ground discrimination. **G**

6. FINDING SHAPES: Have a group of children draw pictures which are collected and redistributed so that no one has their own. Have each child locate all the round shapes or square ones and outline them. (Lerner, 1971, p.133) **A**

Spatial Awareness

1. PEGBOARD DESIGNS: The child must create a design by following verbal instructions, e.g. "Put the red peg in the first

column, first row. Put a blue peg two holes under it." etc.

2. DRAWING SPATIAL DESIGNS: This is similar to the pegboard activity described above but the child is now drawing shapes and lines according to your verbal instructions, e.g., "Draw a circle on the top right corner of the page. Draw a square under it. Draw a line from the bottom of the square to the center of the page."

3. FLOOR PATTERNS: Draw a floor pattern on the board or on a piece of paper. Have the children verbally describe the pattern and then walk it.

Visual Memory and Sequencing

1. PARQUETRY DESIGNS: Have the child observe a design for a short time and then reproduce it from memory. (Furth and Wachs, 1974, p.144)

2. PICTURE STORIES: Make up sets of pictures that illustrate an idea or story. The child must put these in order and then tell the story from memory.

3. PUZZLES AND MAZES:

   a. Make up a sequence of intersecting lines. Given the beginning of a line, the child is expected to follow it and find the end. Ann Arbor Publishers prints a series of these sequences called "Visual Tracking." (Kane, 1978)

   b. Mazes may also be used in which the child must follow the correct path in sequence to solve the problem.

   c. Mazes can be translated from the paper onto the floor. **G**

4. OBJECT REMOVAL: A child is shown a number of objects for a brief amount of time. The child looks away while an object is removed and must then figure out what was taken away.

Visual Attention

1. CONDUCTING: Divide the class into three groups. Each group has a different type of instrument; e.g., group 1—maracas, group 2—triangles, and group 3—drums. Physically separate the groups to the right, middle and left of the room. Each group is conducted by a different body part of the leader, e.g., group 1—the right arm, group 2—the head, group 3—the left arm. The groups must play their instruments according to

how they are conducted, e.g., if the right arm is not moving, group one must be quiet. **M**

You can build up to this activity with stop and go games and fast and slow rhythm playing. You may also want to start with only two groups. Once your class can master the three group division, have an overhead projector shine on the leader whose back is to the class. The class must follow the shadow. Children can take turns conducting once the class has gotten used to the activity.

MOTOR ACTIVITIES:

Eye-Hand/Eye-Body Coordination

1. THROWING: Any activities requiring aiming at a target develop coordination. **G**

2. LACING: Make pictures on cardboard and punch holes along the outline. Using shoelaces have the child weave through the holes.

3. CATCHING: Any activities requiring catching objects develop coordination. **G**

4. LEGOS, PICK-UP STICKS, TINKER TOYS

5. DODGEBALL, KICKBALL, HOPSCOTCH **G**

6. TRACING, DOT TO DOT ACTIVITIES, CUTTING AND PASTING (Lerner, 1971)

7. MIRRORING GAMES: One child does simple movement and another follows. **G**

Fine Motor Coordination

1. FINGER PUPPETS: Use finger puppets and make up stories requiring the fingers to move independently.

2. MUSICAL INSTRUMENTS: Almost all instruments require fine motor control. Most children love playing instruments. While developing your students' coordination, you can play stop and go games for impulse control, work on following specific rhythms for timing and attention span, allow solo or duet times for self-esteem and creative expression, work on specific playing techniques for frustration tolerance and you can teach students to play only at specific times in the song for impulse control, auditory attention and cooperation. The possi-

bilities are endless. Having something concrete to hold, with specific directions as to when to play, provides a safe structure to work on emotional growth as well as perceptual skills. **M**

Gross Motor Coordination

1. JUMPING, RUNNING, SKIPPING, HOPPING, CRAWLING, GALLOPING **G**

2. BALANCE BEAM ACTIVITIES: Develop sequencing skills as well as balance. **G**

3. SOCIAL-EMOTIONAL GAMES:

   a. Stop and go games or "statues"—the teacher plays a rhythm for running with a loud accent at the end for stopping. Check and see if the statues are frozen solid.

   b. Fast and slow—Again, the teacher establishes a rhythm; this time it is fast or slow—or silent, for "freeze." If you have a group of children who have real difficulty with stopping, you might want them to freeze with both hands touching the floor. This gives additional tactile boundaries. **G**

4. ACTION SONGS: Sing songs that involve basic body movements and do them while singing. **M**

Tactile Discrimination

1. FEEL AND IDENTIFY: Without looking, the child must feel various textures such as felt, sandpaper, metal, etc. and describe them. (Lerner, 1971, p.137)

2. FEEL AND MATCH: Paste a number of pairs of different textured material on cardboard circles (lids from beverages "to go" work well). The child must match the pairs without looking. (Kane, 1978) This game is also sold commercially.

3. LETTER IDENTIFICATION: By feeling them, the child must identify wooden beaded or sandpaper letters. (Lerner, 1971, p.137)

4. BLINDFOLDED TOUCH: Touch a blindfolded child and have him/her identify where he/she was touched. The next step is to touch two spots simultaneously and have the child identify both areas. (Furth and Wachs, 1974, p.79)

Body Image

1. BLINDFOLDED TOUCH: (described above). **G**

2. DEVELOPING A BODY MAP:

   a. With the child lying face down, touch one or two body parts. the child must then raise these parts.

   b. If the child cannot identify and lift even one part, try the game lying face up. This is easier.

   c. Develop this into a memory exercise by touching a series of body parts and then having the child lift those parts in sequence. (Furth & Wachs, 1974, p.81) **G**

3. "SIMON SAYS": Play this game with eyes open and with eyes closed. **G**

4. BODY OUTLINES: Trace the outline of a child onto a sheet of paper and then have the child fill it in with features and clothing. (Lerner, 1971, p.111) This can be done with a group on mural or butcher paper. The shapes can also be cut out. **A**

5. ACTION SONGS: Sing songs requiring the use of different body parts. There are a number of records on the market that contain good songs for this purpose—"Songs to Grow On" by Woody Guthrie and recordings by Ella Jenkins, Nelvina Reynolds and Hap Palmer. Youngheart Records (Los Angeles, CA 90027) has an excellent series for classroom use entitled, "We All Live Together." **M, G**

Spatial Awareness

1. ACTION SONGS: Songs such as "Looby-Loo," "Hokey Pokey," and "Did You Ever See A Lassie," help develop body image and an internal awareness of right, left, front, back, up and down. **M**

2. PERSONAL SPACE GAMES: Every child has his/her own defined space. This can be concretized with pieces of tape, hoola-hoops, or circles of string placed on the floor around the child.

   a. At the count of three, two specified people must switch places.

   b. Everyone must leave their space and move to the center of the room in a specified way. At a signal from the leader,

they must all run back to their spaces. This has unlimited variations. Each child can pick a way for everyone to move, or, you can choose a structure such as "move with two hands and one foot touching the floor" and the children must find their own way of doing it.

c. Everyone can have their own space along a wall. The leader gives commands such as walk forward—stop—walk to the left—stop—run forward—stop. When right, left, forward and backwards are mastered try using diagonals. Also have the children turn part way around so that "front" is in a different place. **G**

3. BLINDFOLDED ACTIVITIES:

a. Have the children balance on each foot with eyes open and then with eyes closed for a count of ten. Since balancing is more difficult when eyes are closed, you can help the children by telling them to imagine how far away the walls are and to imagine a line going from one wall to the other through them to hold them up.

b. Make a simple maze course with chairs and mats. Designate the path and have the children crawl through with eyes open and then with eyes closed without touching the obstacles. (Kane, 1982) **G**

Motor Sequencing and Memory Activities

1. ACTION SEQUENCES: Give each child three or four cards with action words on them such as jump, turn, stoop, wiggle, widen, etc. The children must choose an order for their activities and make up an action phrase which they can repeat. They must keep the order they choose and remember the phrase to show the class. Two students can work together, making an action duet. **G**

2. ACT OUT A STORY: Have each child pick an incident to dramatize. Have them act it out (without words) and "tell" it with a clear beginning, middle and end. **G**

3. SPATIAL SEQUENCE: Give each child a sequence of spatial directions and have them perform these in order.

4. GYMNASTICS: Teach gymnastic moves having each stunt begin and end with a clear, frozen, position.

Commercial Materials for Perceptual Activities

1. ALLIED EDUCATION COUNCIL:
   P.O. BOX 78
   GALIEN, MICHIGAN 49113
   - The Fitzhugh Plus Program
   - Perceptual Training
   - Spatial Organization Books

2. ANN ARBOR PUBLISHERS
   CAMPUS VILLAGE ARCADE
   611 CHURCH ST.
   ANN ARBOR, MICHIGAN 48104
   - Michigan Successive Discrimination Program
   - Cues and Signals
   - Perceptual Activities
   - Symbol Discrimination
   - Visual Tracking

3. CONTINENTAL PRESS, INC.
   ELIZABETH, PA 17022
   - Visual Discrimination
   - Visual Motor Skills Levels I & II

4. CREATIVE PLAYTHINGS, INC.
   EDINBURG ROAD
   CRANBURY, NJ 08540
   - Variety of Toys and Games for Perceptual Activities

5. DEVELOPMENTAL LEARNING MATERIALS
   3505 N. ASHLAND AVE.
   CHICAGO, ILLINOIS 60657
   - Association Picture Cards
   - Same and Different Cards
   - Figure-Ground Tapes

6. FOLLET EDUCATIONAL CORPORATION
   1010 W. WASHINGTON BLVD.
   CHICAGO, ILLINOIS 60607
   - The Frostig Program
   - Workbook for Visual Perception

7. HEREWORD LITHOGRAPHIC PUBLICATION
   - Matching Tablets
   - Parts-Whole Activities

8. IDEAL MANUFACTURERS
   1100 SOUTH LAVERGRE
   OAK LAWN, ILLINOIS 60453
   - Pegboards
   - Block Designs
   - Size Forms
   - Fit-A-Space
   - Fit-A-Space

9. MAFEX ASSOCIATES INC.
   111 BARRON AVENUE
   JOHNSTOWN, PA 15906
   - I Can Do It
   - Visual-Motor Activity Exercises

10. NOBLE AND NOBLE PUBLISHERS
    750 THIRD AVENUE
    NEW YORK, NEW YORK 10017
    - Try Experiences for Young Children
    - Visual-Perceptual Tasks

11. J.A. PRESTON CORPORATION
    71 FIFTH AVENUE
    NEW YORK, NEW YORK 10003
    - Material for Motor Assessment and Teaching Eye-Hand Coordination Perception

12. SCIENCE RESEARCH ASSOCIATES
    - Detect - Sensorimotor Approach to Visual Discrimination

13. TEACHING RESOURCES
    100 BOYLSTON STREET
    BOSTON, MASSACHUSETTS 02116
    - Programs for Visuomotor, Perceptual Motor, Eye-Hand Coordination

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